Patent

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Serial No.: 09/879,114
Assignee: Intel Corporation

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT	:	Sundeep M. BAJIKAR
SERIAL NO.	:	09/879,114
FILED	:	June 13, 2001
FOR	:	MOBILE COMPUTER SYSTEM HAVING A NAVIGATION MODE TO OPTIMIZE SYSTEM PERFORMANCE AND POWER MANAGEMENT FOR MOBILE APPLICATIONS
GROUP ART UNIT	:	2186
EXAMINER	:	Shane M. THOMAS

M/S: APPEAL BRIEFS - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

[redacted]

APPEAL BRIEF

Dear Sir:

This brief is in furtherance of the Notice of Appeal, filed in this case on May 17, 2005.

1. REAL PARTY IN INTEREST

The real party in interest in this matter is Intel Corporation. (Recorded June 13, 2001, Reel/Frame 011895/0337).

2. RELATED APPEALS AND INTERFERENCES

There are no related appeals.

3. STATUS OF THE CLAIMS

Claims 1-18 are pending in this application. Claims 19 and 20 have been allowed. Claims 1-5, 8, and 10-12 are rejected. Claims 6, 7, 9, 13, 14 and 16-18 are objected to. This appeal is an appeal from the rejection of claims 1-18.

4. STATUS OF AMENDMENTS

Applicants did not make any amendments to the claim subsequent to final rejection. The claims listed on page 1 of the Appendix attached to this Appeal Brief reflect the present status of the claims (including amendments entered after final rejection).

5. SUMMARY OF THE CLAIMED SUBJECT MATTER

The embodiment of independent claim 1 of the present invention generally describes a mobile system, comprising: a storage device (e.g., 260A-N – page 14, line 6 of the specification); a vibration sensor (e.g., 220 – page 10, line 3) arranged to detect whether there is a presence of sustained or sporadic mechanical vibrations over a designated time duration, and to generate therefrom a vibration signal (e.g., page 17 line 4) indicating the presence of sustained or sporadic mechanical vibrations; and a chipset (e.g., 200 – page 9, line 16) having a storage controller arranged to control accesses to said storage device, including limiting accesses to said storage device to minimize damages to said storage device in response to the vibration signal indicating the presence of sustained or sporadic mechanical vibrations.

The embodiment of independent claim 10 of the present invention generally describes a computer system, comprising: a disk drive; a host processor (e.g., 110A-110N) equipped with an operating system (OS) which enables operation in a normal mode when the computer system is stationary and a Navigation mode when the computer system is mobile (e.g., page 18, line 5); a vibration sensor (e.g., 220 – page 10, line 3) arranged to detect whether there is a presence of sustained or sporadic mechanical vibrations over a designated time duration, and to generate therefrom a vibration signal (e.g., page 17 line 4) indicating the presence of sustained or sporadic mechanical vibrations; a position sensor (e.g., 230 – page 14 line 3) arranged to detect whether there is a change in the position of the computer system at a fixed or variable velocity or acceleration, and to generate a position signal (e.g., page 17 line 4) indicating the change in the position of the computer system; and a chipset (e.g., 200 – page 9, line 16) equipped with a disk drive control logic (e.g., 240 – page 14, line 20) arranged to control disk accesses to said disk drive, including controlling disk accesses to said disk drive in order to reduce damages to said disk drive in response to the vibration signal indicating the presence of sustained or sporadic mechanical vibrations or the position signal indicating the change in the position of the computer system.

The embodiment of independent claim 19 of the present invention generally describes a method for enabling a mobile PC having an operating system (OS) and a chipset (e.g., 200 – page 9, line 16) configured to transition between a normal (stationary) mode and a Navigation (mobile) mode, comprising: receiving an indication from a vibration sensor (e.g., 220 – page 10, line 3) or a position sensor (e.g., 230 – page 14 line 3) attached to the chipset, which requests operation in a Navigation (mobile) mode when there is a presence of sustained or sporadic mechanical vibrations over a designated time duration or when there is a change in the position

of the mobile PC at a fixed or variable velocity or acceleration; changing, at the chipset, system settings and configurations for the mobile PC to operate in the Navigation (mobile) mode (e.g., page 18, line 5); detecting, at the operating system (OS), the changed system setting for Navigation (mobile) mode and changing OS settings and configurations for the mobile PC to operate in the Navigation (mobile) mode (e.g., page 18, line 5); determining whether there is a break from the Navigation (mobile) mode (e.g., page 19, line 3); changing, at the chipset, system settings and configurations for the mobile PC to operate in back in the normal (stationary) mode, when there is a break from the Navigation (mobile) mode; and detecting, at the operating system (OS), the Navigation mode exit and changing OS settings and configurations for the mobile PC to operate in the normal (stationary) mode (e.g., page 19, line 5-10).

In FIG. 1, an example computer system platform having an APM and ACPI system incorporated to handle various types of power management events is illustrated.

Turning now to FIG. 2, an example computer system platform of a mobile PC 100 having a host chipset 200 and a mechanism incorporated therein for identifying between a normal (stationary) mode and a mobile (Navigation) mode in order to optimize mobile PC system performance and power management for mobile applications according to an embodiment of the present invention is illustrated. The purpose of the "Navigation" mode is to identify and differentiate between the stationary and the mobile operating modes of the mobile PC 100. As shown in FIG. 2, hardware such as a thermal sensor 210, a vibration sensor 220 and a position sensor 230 may be incorporated to the host chipset 200 utilized to trigger into and exit from the Navigation mode.

When there is a presence of sustained or sporadic mechanical vibrations or there is a chance of mechanical shocks, the vibration sensor 220 may trigger entry into a Navigation

(mobile) mode from a normal (stationary) mode and exit from the Navigation (mobile) mode back to the normal (stationary) mode. Likewise, the position sensor 230 is utilized to sense whether there is a change in the position of the mobile PC 100 at a fixed or variable rate (velocity) and/or at a fixed or variable acceleration in order to trigger entry into and exit therefrom the Navigation (mobile) mode. Both the vibration sensor 220 and the position sensor 230 may be integrated into the chipset 200, or alternatively, may be attached to the chipset 200 as separate components used to trigger entry into a Navigation (mobile) mode from a normal (stationary) mode and exit therefrom.

For example, FIG. 3 illustrates an example position sensor of the mobile PC using a Bluetooth™ architecture according to an embodiment of the present invention. In this example, the position sensor 230 of the mobile PC 100 may be equipped with Bluetooth™.

FIG. 4 illustrates an example implementation of a position sensor of the mobile PC using a Global Position System (GPS) architecture according to an embodiment of the present invention.

FIG. 5 illustrates an example implementation of a position sensor 230 of the mobile PC according to an embodiment of the present invention. In addition, hardware such as the hard disk drive "HDD" control logic 240 may also be integrated within the host chipset 200 to respond to the thermal sensor 210, the vibration sensor 220 and the position sensor 230 in order to control operation of the hard disk drive "HDD" 250 and other storage devices 260A-260N and enhance **mPC** system optimizations in the Navigation mode.

FIG. 7 illustrates a flowchart of an example hard disk drive (HDD) control logic 250 shown in FIG. 6. When an indication signal is received from the vibration sensor 220 (e.g., magnitude of the vibration) or the position sensor 230, the IDE control logic 620 is utilized to

set up the FIFO threshold level of the IDE FIFO 330 and the delay time, via the IDE control register(s) 610 in order to write/read data to/from the HDD 250 at block 710. For example, if the magnitude of the vibration from the vibration sensor 220 is "high" then the programmable FIFO threshold level may be "high" and the delay time set may be "long". Likewise, if the magnitude of the vibration from the vibration sensor 220 is "low" then the programmable FIFO threshold level may be "low" and the delay time set may be "short".

Next, the IDE control logic 620 initiates writing data to the HDD 250 at block 720. Then the IDE control logic 620 waits until the delay time set is completed at block 730 and the programmable FIFO threshold level is reached at block 740 before data can be written onto the HDD 250. In other words, the data may not be written to the HDD 250 until the delay time set is completed at block 730 and the programmable FIFO threshold is reached at block 740. This way disk accesses (reads or writes) to the HDD 250 and other storage devices 260A-260N can be minimized based on the programmable FIFO threshold level and delay time. If the mobile PC 100 is operating in a normal (stationary) mode, disk accesses may be normal. However if the mobile PC 100 is operating in a mobile (Navigation) mode, the disk accesses may be reduced in duration by doing only short bursts in order to reduce the risk of damage to the hard disk drive "HDD" 250 and other storage devices 260A-260N.

FIG. 8 illustrates a flowchart of an example computer system (mobile PC) operation between the normal (stationary) mode and the mobile (navigation) mode according to an embodiment of the present invention. When a Navigation mode is triggered based on an occurrence of any one of the listed characteristics as described, including the change in the position of the mobile PC 100 at a fixed or variable rate (velocity) and/or at a fixed or variable acceleration from the position sensor 230, the presence of sustained or sporadic mechanical

vibrations of varying magnitude over a certain threshold duration of time, and/or the chance of mechanical shocks from the vibration sensor 220 at block 520, the HDD control logic 240 of the chipset 200 changes the system settings and configurations for operation in a Navigation mode at block 820.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Are claims 1-5, 8, 10, and 15 unpatentable over Gushiken (U.S. Patent Application Publication No. 2001/00415587) in view of Okuyama et al. (U.S. Patent Application Publication No. 2002/0126408)?

7. ARGUMENT

Applicants gratefully acknowledge the Examiner's indication that independent claim 19 and claims 20 are allowable, and that claims 6, 7, 13, 14, 17 and 18 contain allowable subject matter.

In regards to independent claim 1, Applicants respectfully submit that the cited reference do not teach, suggest or disclose "[a] mobile system, comprising: a storage device; a vibration sensor arranged to detect whether there is a presence of sustained or sporadic mechanical vibrations *over a designated time duration*, and to generate therefrom a vibration signal ...". Applicants note that similar allowable limitations are recited in the allowed independent claim 19.

Applicants have argued previously that a vibration sensor to detect the presence of sustained or sporadic mechanical vibrations *over a designated time duration* is wholly missing from the cited references. In forwarding the 103(a) rejection, the Examiner cites to paragraph

[0068] of Okuyama as disclosing a vibration sensor capable of stopping writing to a magnetic disk appraratus, and further states it would have been obvious to use Okuyama to modify the "informed" system of Gushiken to prevent writing *at that time duration which the vibration was occurring.* Applicants respectfully submit that the ability to prevent writing at the time duration which the vibration is occurring is not the equivalent of generating a vibration signal upon the detection of sustained or sporadic mechanical vibrations *over a designated time duration.* In the former (Okuyama), an instantaneous vibration may cause a responsive discontinuation that is unnecessary (e.g., the system could have continued the read/write operation despite a instantaneous yet minor vibration, but was compelled to stop by the sensor). This is obviously an inefficient waste of valuable processing time. However, in the latter, a vibration sensor may react only to a inherent predetermined threshold of necessity, manifested by the predetermined designated time duration. This precludes the unnecessary stoppages of the read/write operation. Such a feature is not reflected in the Okuyama reference, and there is no teaching, suggestion or modification to that effect either. Cited paragraph [0068] states:

> The external sensor may be selectively operated in the use mode, or in the non-use mode. In the case that either the information recording/reproducing unit 23 or the external electronic appliance is equipped with, for example, a vibration sensor and/or an acceleration sensor, when the external sensor is used, the following merits can be achieved. *That is, the external sensor detects that external shocks are applied to the apparatus, so that the data writing operation is stopped, namely, the data protection and the acceleration feedback compensation.* As a result, the external disturbance following characteristic of the head positioning control system can be improved. When the external sensor is not used, since the software processing amount for the data protection is decreased, the performance of the apparatus can be improved. *(emphasis added)*

As stated above, the Okuyama reference merely discloses a vibration sensor capable of detecting external shocks, irregardless of any predetermined time period. Since the cited section of Okuyama does not disclose a vibration sensor arranged to detect ... mechanical vibrations *over a*

designated time duration as specifically recited in claim 1, Applicants respectfully submit the Okuyama reference is inadequate to support a proper 35 U.S.C. 103(a) rejection of independent claim 1. Additionally, the Gushiken reference fails to make up for the deficiencies of Okuyama, as it does not disclose a vibration sensor or any equivalent thereof anywhere in its disclosure. Therefore, Applicants respectfully submit that independent claim is in condition for allowance. Claim 10 contains similar limitations, and therefore is allowable as well. Claims 2-9 and 11-18 depend from allowable base claims, and therefore are allowable as well.

Furthermore, Applicants respectfully submit that the cited references do not teach suggest or disclose "[a] computer system, comprising:... a position sensor arranged to detect whether there is a change in the position of the computer system at a fixed or variable velocity or acceleration, and to generate a position signal indicating the change in the position of the computer system" (e.g., as recited in the embodiment of claim 10). Applicants again note that the allowable limitation quoted above is present in allowed independent claim 19.

The Examiner asserts that Okuyama teaches the use of an acceleration sensor or a vibration sensor and asserts that such a signal contains the ability to detect a fixed or variable acceleration, and generate a signal to stop a data writing operation. The Examiner considers this signal produced by the acceleration sensor to be a position signal, since the detection of acceleration of the mobile computing system of Gushiken would have indicated the system was changing position. Applicants disagree.

Applicants point out that the vibration signal asserted by the Examiner is not actually disclosed in either reference, but is merely a hypothetical assertion made by the Examiner to support the 35 U.S.C. 103(a) rejection. The hypothetical vibration signal forwarded by the

Examiner merely shows that the system is in motion or in a "unstable" condition (*see* Office Action page 3, paragraph 2), and is inadequate to disclose a "position sensor" as disclosed in the embodiment of independent claim 10 as there is no teaching, suggestion or disclosure of the vibration signal in either reference.

Moreover, Applicants respectfully submit the Office Action's assumption that a signal indicating that a system is vibrating (i.e., changing position) is the same as a sensor that indicates position or location is erroneous. A position sensor, may include the ability to locate the system according to some predetermined coordinating system (e.g., a Global Positioning System (GPS) system). For example, Figure 4 of the present invention details an embodiment of a position sensor containing GPS-enabled architecture. The hypothetical "vibration" signal asserted by the Office Action (unsupported by any of the cited references) is inadequate to disclose a position sensor comprising the ability to verify a position of the system according to a predetermined coordinating system as disclosed in independent claim 10. Therefore, for at least this reason, claim 10 is allowable. Claims 11-18 depend from and further define claims 1 and 10 and should be allowable for the same reasons.

Appellants therefore respectfully request that the Board of Patent Appeals and Interferences reverse the Examiner's decision rejecting claims 1-20 and direct the Examiner to pass the case to issue.

The Examiner is hereby authorized to charge the appeal brief fee of **$500.00** and any additional fees which may be necessary for consideration of this paper to Kenyon & Kenyon Deposit Account No. **11-0600.**

Respectfully submitted,

KENYON & KENYON

Date: October 17, 2005

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APPENDIX

(Brief of Appellants Sundeep M. Bajikar
U.S. Patent Application Serial No. 09/879,114)

8. CLAIMS ON APPEAL

1. (Original) A mobile system, comprising:

a storage device;

a vibration sensor arranged to detect whether there is a presence of sustained or sporadic mechanical vibrations over a designated time duration, and to generate therefrom a vibration signal indicating the presence of sustained or sporadic mechanical vibrations; and

a chipset having a storage controller arranged to control accesses to said storage device, including limiting accesses to said storage device to minimize damages to said storage device in response to the vibration signal indicating the presence of sustained or sporadic mechanical vibrations.

2. (Original) The mobile system as claimed in claim 1, further comprising:

a position sensor arranged to detect whether there is a change in the position of said mobile system at a fixed or variable velocity or acceleration, and to generate a position signal indicating the change in the position of said mobile system.

3. (Original) The mobile system as claimed in claim 2, wherein said storage controller of said chipset further limits accesses to said storage device to minimize damages to said storage device in response to the position signal indicating the change in the position of said mobile system.

4. (Original) The mobile system as claimed in claim 3, wherein said storage device corresponds to a hard disk drive.

5. (Original) The mobile system as claimed in claim 4, wherein said storage controller contains registers for the following purposes: (1) set timing (delay, burst size) to control frequency of read/write cycles; (2) set burst size to control how much data is transferred during each read/write cycle; and (3) completely block hard disk access (read or write) if the vibration signal indicates the presence of strong sustained vibrations for short periods of time.

6. (Previously Presented) The mobile system as claimed in claim 4, wherein said storage controller comprises:

control registers arranged to set ~~the~~ parameters for individual transfers (read or write) based on the vibration signal from said vibration sensor or the position signal from said position sensor regardless whether said mobile system is operating in a normal (stationary) mode or a mobile (Navigation) mode, wherein said parameters include a burst size, a transfer count, and a base memory address;

first-in/first-out (FIFO) devices arranged to provide line buffering required for data transfers to said storage device; and

control logic arranged to set up a FIFO threshold level of the FIFO devices and a delay time, via the control registers in order to write/read data to/from said storage device.

7. (Previously Presented) The mobile system as claimed in claim 6, wherein said control logic initiates writing data to said storage device, waits until the delay time is completed and the FIFO threshold level is reached before data can be written onto said storage device.

8. (Previously Presented) The mobile system as claimed in claim 4, wherein said position implemented with communication devices according to Bluetooth specification or Global Position System (GPS) standards.

9. (Previously Presented) The mobile system as claimed in claim 8, wherein said position sensor is used to trigger the mobile system to operate in a Navigation mode when the mobile system is out of position or disconnected from an Access Point operating according to Bluetooth specification, and exit from the Navigation mode when the mobile system is stationary or connected with said Access Point.

10. (Original) A computer system, comprising:

a disk drive;

a host processor equipped with an operating system (OS) which enables operation in a normal mode when the computer system is stationary and a Navigation mode when the computer system is mobile;

a vibration sensor arranged to detect whether there is a presence of sustained or sporadic mechanical vibrations over a designated time duration, and to generate therefrom a vibration signal indicating the presence of sustained or sporadic mechanical vibrations;

a position sensor arranged to detect whether there is a change in the position of the computer system at a fixed or variable velocity or acceleration, and to generate a position signal indicating the change in the position of the computer system; and a chipset equipped with a disk drive control logic arranged to control disk accesses to said disk drive, including controlling disk accesses to said disk drive in order to reduce damages to said disk drive in response to the vibration signal indicating the presence of sustained or sporadic mechanical vibrations or the position signal indicating the change in the position of the computer system.

11. (Original) The computer system as claimed in claim 10, further comprising:

a flash memory connected to the chipset, to store a set of system basic input/output start up (BIOS) instructions at startup, and ACPI instructions implemented to provide various power saving functions, manage the progress of power saving between full-on, standby, and sleep mode, and to provide transitions between the normal mode when the computer system is stationary and the Navigation mode when the computer system is mobile from applicable ACPI states.

12. (Original) The computer system as claimed in claim 11, wherein said disk drive control logic contains registers for the following purposes: (1) set timing (delay, burst size) to control frequency of read/write cycles; (2) set burst size to control how much data is transferred during each read/write cycle; and (3) completely block hard disk access (read or write) if the vibration signal indicates the presence of strong sustained vibrations for short periods of time.

13. (Previously Presented) The computer system as claimed in claim 11, wherein said disk drive control logic comprises:

control registers arranged to set parameters for individual transfers (read or write) based on the vibration signal from said vibration sensor or the position signal from said position sensor regardless whether said mobile system is operating in a normal (stationary) mode or a mobile (Navigation) mode, wherein said parameters include a burst size, a transfer count, and a base memory address;

first-in/first-out (FIFO) devices arranged to provide line buffering required for data transfers to said disk drive; and

control logic arranged to set up a FIFO threshold level of the FIFO devices and a delay time, via the control registers in order to write/read data to/from said disk drive.

14. (Previously Presented) The computer system as claimed in claim 13, wherein said control logic initiates writing data to said disk drive, waits until the delay time is completed and the FIFO threshold level is reached before data can be written onto said disk drive.

15. (Previously Presented) The computer system as claimed in claim 10, wherein said position sensor is implemented with communication devices according to Bluetooth specification or Global Position System (GPS) standards.

16. (Previously Presented) The computer system as claimed in claim 10, wherein said position sensor is used to trigger the mobile system to operate in a Navigation mode when the mobile system is out of position or disconnected from an Access Point, operating according to Bluetooth specification and exit from the Navigation mode when the mobile system is stationary or connected with said Access Point.

17. (Previously Presented) The computer system as claimed in claim 10, wherein, when the Navigation mode is triggered in response to the vibration signal or the position signal, said disk drive control logic of the chipset changes system settings and configurations for operation in the Navigation mode, and said operating system (OS) then detects the changed system setting for

Navigation mode and changes OS settings and configurations for operation in the Navigation mode.

18. (Original) The computer system as claimed in claim 17, wherein, when there is a break from the Navigation mode, said disk drive control logic of the chipset changes system settings and configuration for operation in the normal stationary mode, and said operating system (OS) then detects the exit from the Navigation mode and changes OS settings and configurations for operation in the normal stationary mode.

19. (Previously Presented) A method for enabling a mobile PC having an operating system (OS) and a chipset configured to transition between a normal (stationary) mode and a Navigation (mobile) mode, comprising:

receiving an indication from a vibration sensor or a position sensor attached to the chipset, which requests operation in a Navigation (mobile) mode when there is a presence of sustained or sporadic mechanical vibrations over a designated time duration or when there is a change in the position of the mobile PC at a fixed or variable velocity or acceleration;

changing, at the chipset, system settings and configurations for the mobile PC to operate in the Navigation (mobile) mode;

detecting, at the operating system (OS), the changed system setting for Navigation (mobile) mode and changing OS settings and configurations for the mobile PC to operate in the Navigation (mobile) mode;

determining whether there is a break from the Navigation (mobile) mode;

changing, at the chipset, system settings and configurations for the mobile PC to operate in back in the normal (stationary) mode, when there is a break from the Navigation (mobile) mode; and

detecting, at the operating system (OS), the Navigation mode exit and changing OS settings and configurations for the mobile PC to operate in the normal (stationary) mode.

20. (Previously Presented) The method as claimed in claim 19, wherein said system settings and configurations for the mobile PC to operate in the Navigation (mobile) mode include setting parameters for individual transfers (read or write) based on the indication from said

vibration sensor or said position sensor, in which said parameters include a burst size, a transfer count, and a base memory address; and setting up a threshold level of FIFO devices and the delay time in order to initiate writing data to said disk drive, wait until the delay time is completed and the FIFO threshold level is reached before data is written onto said disk drive.

9. EVIDENCE APPENDIX

No further evidence has been submitted with this Appeal Brief.

10. RELATED PROCEEDINGS APPENDIX

Per Section 2 above, there are no related proceedings to the present Appeal.